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Interactive Design: Designing Sensorial, Dialogical Spaces

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Abstract

In this short paper, we describe an ongoing research project which is mainly based on the realization of several installations using interaction design as an essential quality. In Arts, the digital art, which is part of the so called new media art, represents a topic of actuality together while raising issues regarding its curation. Interactive installations, mainly artistic endeavors with intriguing outcomes and some using artificial lighting as a tool, introduce a different kind of experience than artworks exhibited and forbidden to be touched. Thanks to their interactive aspects, the user becomes a participant either willingly or unwillingly and influences the overall scene. These immersive installations have the potential to challenge the notions and perception of space, as well as to enrich any activity within that space. The interactive space becomes a place with intriguing qualities, an icon of human interaction and one that has the ability to adapt to our needs, while at the same time shaping our experiences. This interaction is not only with the installation itself, but also between individuals, thus fulfilling the evolving individual and social demands or intentions.

Rezumat

În acest scurt articol descriem proiectul de cercetare în curs, bazat în principiu pe realizarea unor multiple instalaţii care utilizează "interaction design" ca şi caracteristică de bază.
În Arte, arta digitală parte a aşa numitei "new media art" reprezintă un subiect de actualitate alături de aspectele pe care le ridică în ceea ce priveşte aspectul curatorial. Instalaţiile interactive, in general încercări artistice cu remarcabile rezultate si unele utilizând iluminatul artificial ca instrument, introduc o experienţă diferită faţă de obiectele de artă expuse şi a căror atingere este interzisă. Datorită aspectului interactiv, utilizatorul devine participant atât voluntar cât şi involuntar şi are o influenţă asupra scenei globale. Captivante, aceste instalaţii au potenţialul de a provoca noţiunile şi percepţia de spaţiu, precum şi de a îmbogăţi orice activitate din acel spaţiu. Spaţiul interactiv devine un loc cu calităţi remarcabile, o pictogramă de interacţiune umană şi una care are capacitatea de a se adapta la nevoile noastre şi totodată formează experienţele noastre. Interacţiunea în cauză nu se referă doar la instalaţia în sine, cât şi între noi de asemenea, deci îndeplinind cereri sau intenţii individuale şi sociale.

Keywords: Interactive Design; Interaction Design; Intuitive Interaction; Sensorial; Installations.

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1. Introduction

The Sensorial Space installation is part of a research project which deals with interactive space as a concept. It dwells on the subject of Interactive Design rather than Interactive Architecture as Interactive Architecture is a larger domain also covering Interactive/Media Facades which is not the focus of our research. The underlying idea is that of dealing with space at a human scale and dealing with the interactive feature of a project's design phase which slowly seems to appear especially in media projects, education, health and arts. Though currently seen as a luxury, it is thus widely applicable. Architects seem to be interested in creating interactive installations because of the creative freedom it offers, such as in competitions. With the widespread of technologies, people tend to interact more virtually. The importance of media installations lies in the fact that they facilitate face-to-face social interactions. Also, do these technologies pollute or disturb our surroundings, rather than enhance them, or improve communication, social interaction? We think that when it is done well it can enhance the public space. It becomes an integral part of the surroundings and of the activities. It is also about creating something that people can remember.

Interactive installations are though a subcategory of installation art that appeared starting with the 1920s and they are most frequently created and exhibited since 1990s, when artists were particularly interested in using the participation of the audiences to trigger and disclose the meaning (message) of the installation. According to Bonnemaison and Ronit [3:description] an installation is "usually the end product for an artist, but for architects it can also be a preliminary step in an ongoing design process". They consider the critical role that installations will play in the practice of architecture, the role of them being of sharpening our understanding of the built environment. The installation is a "three-dimensional work of art that is site-specific" [3:14].

So the question is also what happens when an architect creates an installation and how this work is being different than the one made by an artist? One answer could be that it doesn't concern the work itself perhaps, but in what it offers to the field of architecture, mainly as mentioned before, the freedom to experiment, an opportunity like the competitions to explore ideas that can later be incorporated into built work. "For other firms, creating installations is a way to shift the focus from the built work to the design process." and as seen today "there is no doubt that installations have become a major mode of expression for the practice of architecture" [3:17:21].

The digital revolution and design represents an actual topic today. With a constant dynamic, always evolving and becoming of more and more interest because of the future technologies that are being developed like 3D printing, computational advancements and so on, it is the future of architecture, design, art and other fields. As Nicholas Negroponte, MIT Media Lab, wrote in 1998 "Yes, we are now in a digital age, to whatever degree our culture, infrastructure, and economy (in that order) allow us." [4:661].

Immersive interactive designs challenge the notions and perception of space, as well as enrich an activity within that space. The interactive space is a place with intriguing qualities, becoming an icon of human interaction.

People have more or less been expected to adapt to an environment rather than it adapting to their desires. Different levels of interaction and behavioral awareness can be achieved by the use of sometimes rather simple techniques, people becoming participants either willingly or unwillingly (for example the Interactive Video Installation by the students of the University of Michigan, USA,2010).

These designs change how people interact with their environment and each other, thus fulfilling evolving individual, social and environmental demands "The information revolution has changed the way we interact with everything..." [4:preface]. Consequently, as mentioned, a unique sense of space is created, that has the ability to adapt to our needs, while at the same time shape our experiences. "To designing for usability, utility, satisfaction, and communicative qualities, we should add a fifth imperative: designing for sociability." [4:foreword]

Throughout the process of creating these spaces, a better understanding of space, of different media represent the outcomes at the level of knowledge. The installations focus on dealing with the space and responding not only from an aesthetical point of view. This represents the strong point that transforms them from artistic realizations, "sculptures", into something that has a deeper value, understanding, transmitting and receiving at the same time knowledge. Knowledge is something that is in constant movement, the transfer of it can be realized in different ways. The production of new knowledge is important and transmitting it through installations, in a unique way, it is something envisioned.

2. Installation

Sensorial Space presented within ByDesignForDesign0 in Brussels, Belgium, April-June 2011, is an interactive installation part of the research project "Interactive Design: Designing Sensorial, Dialogical Spaces". ByDesignForDesign0 represented the last session of the Research Training Sessions, organized at an international level, and it consisted of designing a possible output of the research and then reverse engineer the potential research and the design processes leading up to such an output.

Sensorial Space was designed by the authors together with an IT engineer and researcher. It mainly transformed the computer's camera into a motion sensor through a software. When the camera was detecting movement there was a halftone or clear video recording of the activity within that space that was then projected onto a surface.

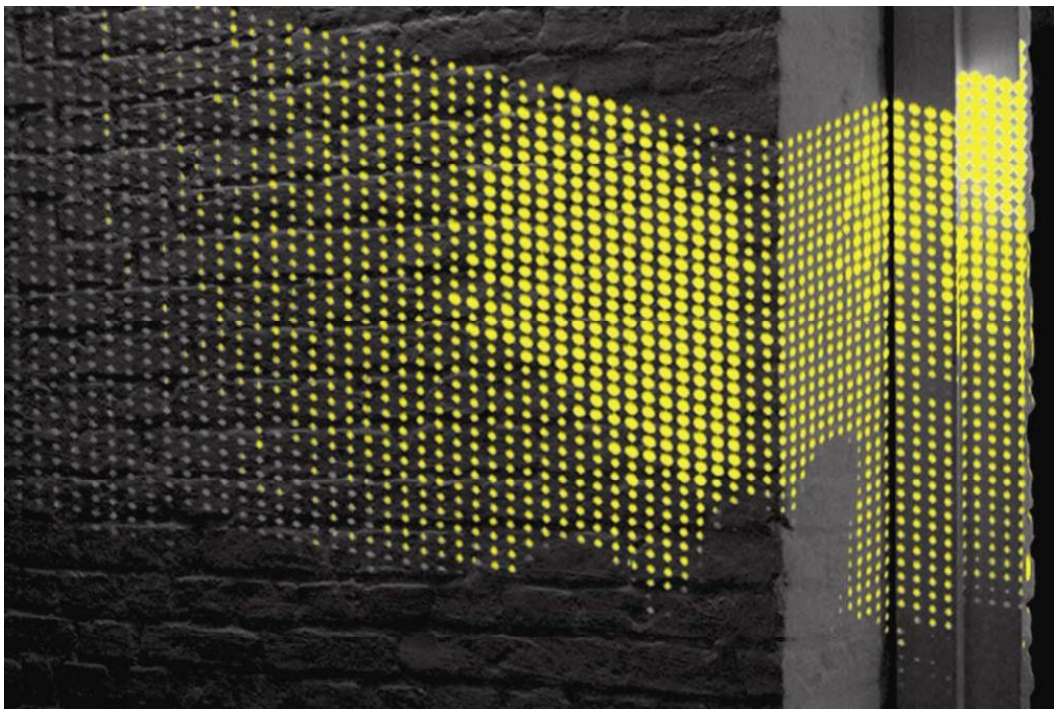

Figure 1. Halftone Pattern projection of the activity within the space.

The project uses the visual component as a main attribute; by the use of the halftone pattern the image becomes clearer as seen from the distance as well as having a distinction between the dark and lighted areas. No movement within the space would trigger an animation projected as well. The succession of the recordings and animation were creating a dynamic skin, of course by embedding the sensor and other components into the materials more advanced design could be created. The idea was that by the use of simple elements to create an interactive space, a space where the surrounding surfaces would react to the activity within and people's movement. Overall, the installation received an interest from the passersby and in general it had quite a positive impact upon the existing space.

The installation presented in Brussels in 2011 is perhaps considered to be at first sight common since more advanced examples exist out there. But the unique feature is that it tries to deal with the space, to transform it and dealing with the space it is at the core of architecture. The space becomes an intriguing one as seen from the reaction of the passersby. The space in architecture is uniquely seen by each architect and this is the beauty of architecture as well. Today, collaboration is the key to a better and much more interesting result, so in this case collaboration led to a faster result and an intriguing outcome. Architects working together with artists, designers, engineers, sociologists and so on seems to be today on a regular basis, or the intention is to further enhance and promote this aspect. Of course the language of communication remains still questionable, but the idea is of a transdisciplinary approach. Practice based research is also becoming more important and a recent topic today, where practice and theory fuse together and collaboration platforms are central.

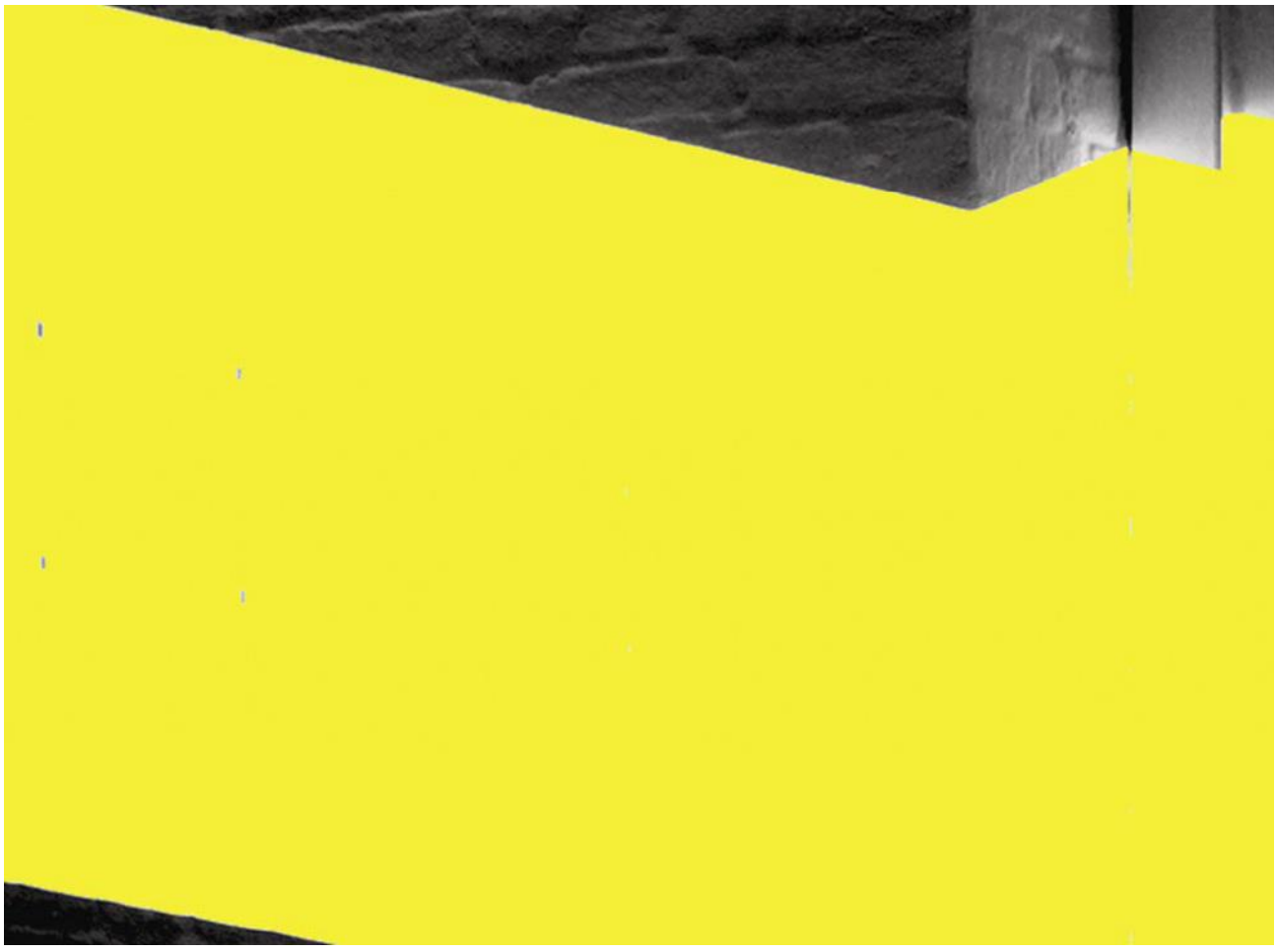

Figure 2. Projected animation indicating no activity within that space.

From a technological point of view, it tries to use the existing technologies, reinterpret them so the cost is very low. A further applicability would be to use the Kinect sensor that "stands out as an affordable, advanced and effective alternative." [5]. The setup of the installation was quite easy, not requiring special knowledge since it included a computer, a beamer and the software that was running on the computer.

The installation was considered more as a prototype in a way, testing out a concept, so of course future applicability is envisioned already (redeveloping the software, using the Kinect sensor, projecting on multiple surfaces and so on).

3. Feedback

When the installation was presented in 2011 in Brussels, no special questionnaire for the participants/passersby was used, only mere observation and from time to time feedback or interest received from them were sufficient to gain valuable insight. The interest seemed quite high, in wanting to know details, how it was functioning, what it represented testing it and so on. This shows in a way a positive feature of this sort of installations, in the idea that it transforms the space which becomes much more memorable, educative, interesting in today's Information Age that we live in. What it is important though is not to abuse with these sorts of installations, so an implication from architects, designers, artists and other fields involved making the best result in a way, thus not becoming means of advertising only as the case of most of the media facades.

Within the research project, the emphasis was put on the collaboration than in recordings/logs in a way. Using a transdisciplinary approach is prior not only for this installation but future ones as well. Regarding future interactive installations a recorded feedback from the passersby is intended, videos showing their reaction and not only photos as within this case.

The methodologies of creating installations are flexible. They are seen as environments open for exploration rather than finished works so participants become artistic collaborators, performers and part of the installation. So the question is what makes an installation engaging? The installation is a three-dimensional and relates to the space surrounding it evoking a spatial experience. Generally computer based and frequently relying on sensors, the dialogue between the participant and the installation is important Also a question is how effective interactive installations are when installed into mundane situations and how this promotes change?

The installations can be education based, informative or "just for fun", the later being less evident in a way. Engaging with the public, educating it in a new and exciting way, bringing people together, promoting team work, thought provoking are all prior and important within creating interactive installations. Another role of the installations is in sharpening our understanding of the built environment, being site-specific so contextual.

4. Evaluation

Overall, the importance of the interactive installations seemed to exist, considering the fact that the space was transformed and the passersby were intrigued to learn more about it. This can be considered as a rather positive outcome.

The weaknesses are perhaps the rather the superficial use of them, so the case where the dialogue is not evident, or the transmission of knowledge is low. That is why we believe that collaboration between architects, artists, designers, engineers and so on is prior. Without such practices the result

is inferior and even uninteresting.

Creating interactive spaces with a sense and the challenges are mainly related to funding these types of projects, that in certain cases are seen as being luxury or made "just for fun. However, this was not entirely the case. An important challenge in this case was the language of collaboration, being considered a multidisciplinary platform in a way, sometimes it may be seen as a downside rather than a positive one. The idea of the collaboration is now very obvious and implicit in a way.
We envision these type of installations as means of improving our daily life and the spaces that we live/work in, so it's not mere a platform for advertising, but actually trying to help the user in some cases to discover something new, to emphasize the characteristics of s space by making it more secure.

The case of some passage ways in the city that are rather dangerous. Or the use in kindergartens, as means of learning and discovering for kids. Again, we would like to repeat that fact that these type of installations should not be seen as realized with no or reduced reason, or just to distract the user/passerby but as means to improve our daily lives and enhance our experiences in a positive way.

Considering the time and cost invested for achieving the intended result, overall the installation offers some unique features. The time for creating the special software, that was transforming the webcam of the laptop into a motion sensor, was relatively short, installing the required equipment, laptop and beamer, was feasible as well and the costs were significantly low. Of course there are much more sophisticated interactive installations out there, but the idea was that of using these simple elements and reducing the costs as much as possible, to simulate the interactivity, try to analyze the feedback from the passersby and use these experiences to develop a more solid project.

5. Future prospects

The envisioned installations will try to break new ground, involve the public and create intriguing spaces using interaction design, smart materials and new technology available today. Each concept will be unique and based on specific situations, contexts, the end result will illustrate a fusion between design, architecture and art.

Figure 3. Simulation including the Brussels urban context.

Regarding the interactive aspect, "the user on the other hand has two options how to relate to the

system: passive or active". "In the passive the system works in the background" the system being composed in general of different elements "sensors register the environment, controllers determine what kind of actions need to be taken, actuators make the desired change happen, and materials realize the physical part of the system." [1]. By the use of interactive/innovative materials, more advanced designs could be created, as well as further enhancements regarding a successful dialogue of the users with a space could be achieved. Composite materials are starting to be more and more developed and used. Lifting materials from their usual dependence on surfaces and utility will lead to redefining our physical boundaries. This characteristic is sometimes achieved without requiring any sensory equipment, motor functions or even operational energy input.

Figure 4. Another view of the simulation that includes the Brussels urban context.

The interaction can be realized on multiple levels, "the three different levels of interaction: reactive (reacts to the input given by the participant), pro-active (not only responsiveness to people's interaction but a contribution to present-time changes that take people by surprise) and dialogical (when the interaction between people with information and with themselves triggers social transformation)." [6]. The spaces created should rely on a bidirectional, cognitive and constructive information exchange that allow active participation rather than simple usage. It is important to be a cognitive and bidirectional information exchange and not just a use of space, creating artificially some dynamic surfaces, the case of the advertisement facades existing today. Used as huge displays, these types of examples are not the ones referred to, but more the small scale interventions existing and starting of being developed.

Exploring new levels of interactivity implies new technologies and testing several solutions available today. Due to the multitude of these solutions, new ones being developed as we speak, the idea of reinventing, redesigning a space becomes imminent. Also, the interactive feature should not be an afterthought but considered when designing the space. As considered by William Mitchell, "Architecture is no longer simply the play of masses in light. It now embraces the play of digital information in space.". The sense of space, spatial thinking is something that has been very present, in Oskar Hansen's view the color could be space, while James Turrell uses light to create new fascinating spaces or underline characteristics of existing ones like the case of the spiral shaped space of the Guggenheim Museum in New York.

Technological advancements sustain the feasibility of these interactive designs. There will

always be new technologies appearing and thus new ways of designing spaces, creating new designs which constantly respond to the growing needs of people.

6. Conclusions

In conclusion the interactive installation offered a unique space that has the possibility to transform the way people interact with each other and within the space. We consider that especially within the Art world where these installations first appeared, there is a new way to link it with technology that evolves in parallel and becomes much more present in our lives. In the future, we envision more sophisticated installations like iLIGHT for that offer much more to the passersby.

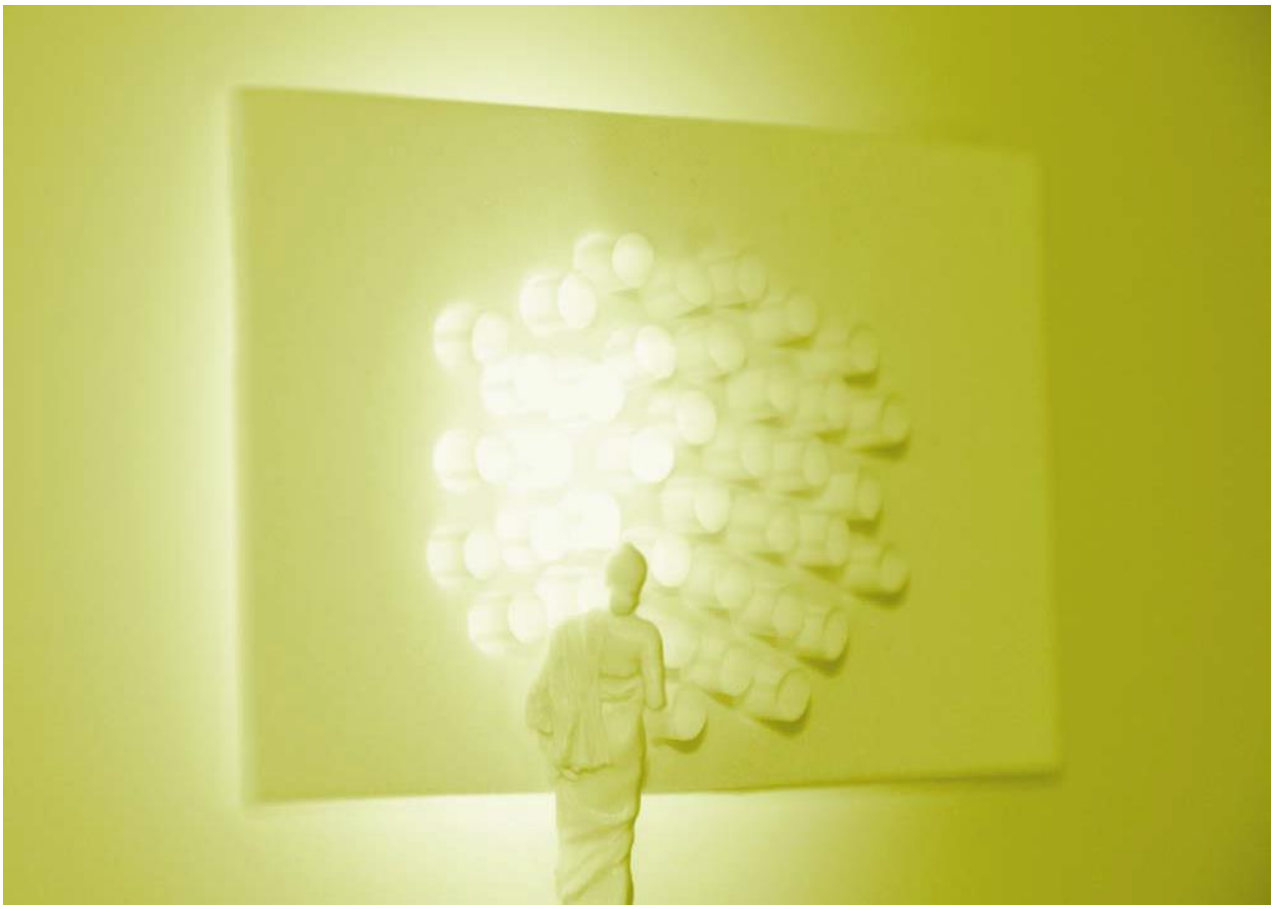

Figure 5. Conceptual model of the iLIGHT Interactive Installation.

Using new, ultra materials is also envisioned, since the material technology evolves as well and more and more complex and mixed materials appear (wire mesh with LED, fibre optic panels and concrete, LED film, glass with embedded LED, OLEDs and others).

This project is at its beginning, lots of ideas remaining to be discovered, tested and put into practice. Most of the projects realized so far are treating, reinventing the surfaces, what they are and what they can do, rather than spaces.

The main contribution is the interactive installations that represent a vehicle for developing the understanding, a unique way to communicate and respond to a public, overall an essential part in the knowledge production.

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